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Authors

Zawadzki, Matthew J
Danube, Cinnamon L
Shields, Stephanie A

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How to Talk about Gender Inequity in the Workplace: Using WAGES as an Experiential Learning Tool to Reduce Reactance and Promote Self-Efficacy

Matthew J. Zawadzki · Cinnamon L. Danube ·
Stephanie A. Shields

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Abstract Interventions aimed at raising awareness of gender inequity in the workplace provide information about sexism, which can elicit reactance or fail to promote self-efficacy. We examined the effectiveness of experiential learning using the Workshop Activity for Gender Equity Simulation – Academic version (WAGES-Academic) to deliver gender inequity information. To assess whether the way gender inequity information is presented matters, we compared WAGES-Academic to an Information Only condition (knowledge without experiential learning) and a Group Activity control condition. We predicted that only the information presented in an experiential learning format (i.e., WAGES-Academic) would be retained because this information does not provoke reactance and instills self-efficacy. Participants ($n=241$; U.S. college students from a large mid-Atlantic state university) filled out a gender equity knowledge test at baseline, after the intervention, and then 7–11 days later (to assess knowledge retention). In addition, we measured feelings of reactance and self-efficacy after the intervention. Results revealed that participants in the WAGES condition retained more knowledge than the other conditions. Furthermore, the effect of WAGES vs. Information Only on knowledge was mediated by WAGES

producing less reactance and greater feelings of self-efficacy. Results suggest that experiential learning is a powerful intervention to deliver knowledge about gender equity in a non-threatening, lasting way.

Keywords Experiential learning · Gender equity · Intervention · Reactance · Self-efficacy · Sexism

Introduction

Interventions aimed at raising awareness of gender inequity in the workplace necessitate giving participants information about sexism and sexual harassment to increase their knowledge (e.g., Hunt et al. 2010). For example, people may overestimate the prevalence of sexist attitudes among their peers and shape their behavior to match what they believe is normative, which requires that people be given information about social norms to reduce sexist attitudes (Kilmartin et al. 2008). Providing knowledge through women's studies and diversity courses has also been shown to reduce sexism (Jones and Jacklin 1988). Yet, the effectiveness of delivering information can be undermined if the new knowledge elicits reactance (i.e., denial of the veracity of information; Brehm and Brehm 1981) or does not promote feelings of self-efficacy (i.e., feeling personal control or agency; Bandura 2004), either of which can diminish message acceptance. In this paper we examine whether an experiential learning activity, the Workshop Activity for Gender Equity Simulation – Academic version (WAGES-Academic; Shields et al. 2011), is effective at delivering information about gender inequity in the workplace without producing these negative consequences.

As sexism is a global issue (Swim et al. 2009), knowing how to deliver information about its existence, effects, and ways to counteract it has relevance beyond the U.S. Our

M. J. Zawadzki (✉)
Department of Biobehavioral Health,
The Pennsylvania State University,
University Park, PA, USA
e-mail: mjl172@psu.edu

C. L. Danube
Department of Psychiatry and Behavioral Science,
University of Washington,
University Park, PA, USA

S. A. Shields
Department of Psychology, The Pennsylvania State University,
University Park, PA, USA

focus here, however, is on an intervention specifically designed for the U.S., and we test it on a U.S. university student sample. In addition, the cited studies are based on U.S. samples. To examine whether experiential learning is effective at delivering information about gender inequity in the workplace, we compare WAGES-Academic to a condition in which the same information is provided but without the experiential learning component. We then examine several mechanisms for WAGES-Academic's effectiveness at increasing knowledge about gender inequity, namely whether WAGES delivers information in a way that reduces participant reactance and promotes feelings of self-efficacy for using the information from the intervention.

The Importance of Teaching about Gender Inequity and Subtle Sexism

Gender inequity in the workplace, especially in male-dominated environments like science, technology, engineering, and mathematics (STEM) fields, continues to be a problem that affects women's careers. These effects include, but are not limited to, unequal pay (Bellas 1993; Frieze et al. 1990; Renzulli et al. 2006) and slower advancement rates (Ginther and Hayes 2003; Wright et al. 2003). Furthermore, sexual harassment, which is undergirded in part by sexism (e.g., Begany and Milburn 2002), leads to lower morale, poorer productivity, increased absenteeism, increased use of health insurance, and greater turnover (e.g., Chan et al. 2008). In other words, sexism directly and indirectly affects both individuals and organizations.

Much of the gender inequity that occurs in the modern-day workplace comes in the form of subtle sexism (Barreto et al. 2009; Rudman and Glick 2008; Swim et al. 2001). Subtle sexism is often unintentional and may go unnoticed because it is perceived to be customary or normal behavior (Swim and Cohen 1997). An example of subtle sexism is the presumption that, in heterosexual relationships, women are responsible to attend to the everyday needs of children, such as taking off of work to care for a sick child, because women are stereotyped as more nurturing than men (Glick and Fiske 2001). This type of subtle sexism can lead to perceptions that women take their career less seriously and can result in conflict between work and family (Allen et al. 2000; Greenhaus and Beutell 1985). As a result, in order for interventions aimed at reducing sexism in the workplace to be successful, interventions must demonstrate how to identify and respond to gender inequity and subtle sexism in the workplace (Swim et al. 2004).

Barriers to Teaching about Gender Inequity: Reactance and Low Self-Efficacy

Teaching people about gender inequity and sexism may be met with resistance, such as reactance. In an information-

based context, we define reactance as a motivational state to refuse information and consider it untrue regardless of its content or actual veracity, typically because the information is perceived as constraining one's choices (based on Brehm and Brehm 1981). Information about subtle sexism can create reactance because many subtly sexist beliefs and actions are associated with beliefs about the inevitability and naturalness of existing gender arrangements (Jost and Kay 2005). For instance, the belief that women and men are opposite though complementary manifests in prescriptions that women are best suited to supportive and nurturing roles whereas men are best suited to dominance and achievement roles (Glick and Fiske 1996). As a result, it is easy for people to believe that subtle sexism is not a problem (Swim et al. 1995), making attempts to change subtle sexism seem unnecessary and ill-founded (Glick and Fiske 2001). Reactance to information about gender inequity can escalate to the point where individuals feel hostile to demands for fairness (Glick and Fiske 1997). For example, in response to affirmative action for women in the 1960s, many managers experienced reactance to these fair employment policies and reported less desire to hire women regardless of their prior hiring tendencies (Brehm 1966). Furthermore, in the face of strong vs. weak fair employment policies, while managers were equally likely to say they would hire women and men, the managers gave women lower starting salaries (Rosen and Mericle 1979). In other words, in these examples, the equal opportunity policies made people feel as though their choices were constrained and led people to reject information and adopt behaviors contrary to the policies even though they may have agreed with them. Thus, to be effective, information about gender inequity must be conveyed in a way that does not lead to rejection of the message via reactance.

Teaching people about gender inequity and sexism should be done so as to increase feelings of self-efficacy. In an information-based context, we define self-efficacy as people's perceptions that they can use information to implement behaviors that should help them achieve a goal (based on Bandura 1977). Research on self-efficacy has largely been conducted in the context of factors that predict whether or not individuals will accept information about health threats and act to eliminate them. This research demonstrates that self-efficacy increases message acceptance and promotes both behavioral intentions and behaviors (e.g., in the context of health promotion see Bandura 2004; Floyd et al. 2006; Good and Abraham 2011). Thus, one goal of interventions should be to instill a sense of self-efficacy in participants (Bandura 1992; Schwarzer 1992), leading them to conclude that they have the knowledge and ability to use the information they have learned to address the threat or problem directly (Witte 1992). Consequently, to promote acceptance of messages about the problem of gender inequity, information should be conveyed in a way that promotes feelings of self-efficacy.

Experiential Learning: A Route to Reducing Reactance and Promoting Self-Efficacy

Experiential learning offers a model for how information can be shared in a way that does not elicit reactance or impede self-efficacy. Kolb's (1984) highly influential model of experiential learning proposes that ideas and beliefs are not fixed, but rather are dynamic and continually being reshaped and reformed based on new knowledge and experience. Specifically, individuals go through a four stage process of learning (Kolb 1984; Kolb and Kolb 2005). This process starts with individuals having a concrete experience (whether generated spontaneously or through a structured intervention) on which they can then reflect. Through peer learning and discussion (Schmidt et al. 2007), this reflection then leads individuals to form abstract ideas about their experiences, in which they connect their present experience to past and future experiences. Finally, participants are encouraged to actively experiment with the acquired knowledge and to incorporate new experiences in the learning process. In the professional development context, for example, successful delivery of experiential learning includes an activity that has clear connections to situations individuals are likely to encounter in their workplace lives (Webster-Wright 2009).

Experiential learning is an effective learning tool in diverse domains. It appears to be particularly effective in contexts in which complex information must be processed (e.g., Burke et al. 2011) and contexts in which deeply ingrained behavioral attitudes are challenged (e.g., Eubank et al. 2011). Thus an experiential learning-based activity is well suited for teaching about gender inequity.

WAGES-Academic is an Experiential Learning Intervention

WAGES-Academic is a brief activity that incorporates experiential learning to teach individuals about subtle sexism in the workplace. Participants learn about the cumulative effect of subtle, nonconscious bias, discuss how that bias can hinder women's advancement in the workplace, and discuss solutions for what can be done to reduce subtle bias (see Shields et al. 2011 or www.wages.la.psu.edu for a more detailed description of WAGES-Academic). During the intervention, individuals on two teams (Green and White) advance from Assistant to Full Professor in a board-game format. Players draw cards for their respective teams that describe day-to-day workplace scenarios encompassing a range of issues, including work/family balance, access to mentoring, workplace climate, and token status. As participants go through the activity, the gendered nature of the teams emerges as the Green

Team's cards describe bias that women might experience in a STEM domain, whereas the White Team's cards describe parallel events where men do not experience bias. For example, a member of the Green Team (representing women) is criticized for being forceful in discussing an issue with colleagues, whereas a member of the White Team (representing men) is praised for his assertiveness. It is important to note that all cards are based on multiple empirical studies and/or demographic data. Although the focus of WAGES is on gender bias, many items also relate to men from underrepresented groups and multiple marginalization of women, as through racial, ethnicity, or ability status. Overall, the cards are designed to give small advantages to the White Team that accumulate over the course of the game to slow the Green Team's relative advancement. This is meant to simulate the manner in which small advantages given to men accumulate to slow women's rate of advancement over the course of one's career (Valian 1998). Once the game play portion ends, participants engage in a directed discussion about the activity. During discussion, they compare Green and White cards for the same situation and come to notice how the same events are judged differently, or result in more positive benefits for the White team than the Green team. Discussion concludes with consideration of actions that can be taken at individual, group, and institutional levels to counteract subtle and nonconscious gender bias that participants learned about in the activity.

Building on Kolb's (1984) model, WAGES uses the features of experiential learning demonstrated to be most effective. That is, it focuses on incremental acquisition of knowledge (i.e., initial experiences during game play that are followed by deeper understanding through reflection and discussion) so as to reduce reactance and foster self-efficacy by encouraging participants to identify specific strategies to apply what they have learned. In the game portion of the intervention, participants see and experience how unconscious bias operates to have a cumulative effect. Participants then reflect on and discuss this bias. As a result, exposure to knowledge is assimilated in a way that participants are more likely to accept. Furthermore, the design of WAGES is consistent with research which demonstrates the efficacy of educational environments that are learner-centered (Bransford et al. 2000). Finally, WAGES capitalizes on the use of small teams, which has been shown to accelerate the learning process (Springer et al. 1997).

The Present Research

We examined the effectiveness of WAGES-Academic at elevating and maintaining participant knowledge about

gender inequity using a three-part study design. We assessed knowledge prior to intervention, immediately following intervention, and at follow-up. We compared the *WAGES* intervention to two control conditions: (1) a *Group Activity* that included a discussion of group based issues, and (2) an *Information Only* condition that provided information about gender inequity in a non-experiential learning format. These controls were included to ensure that simply engaging in a group activity or receiving the information from *WAGES-Academic* in a non-experiential learning format cannot account for the observed effects. Furthermore, including the *Information Only* condition allowed us to examine the mechanisms by which *WAGES* is effective at increasing knowledge about gender inequity, as both *WAGES* and the *Information Only* conditions provided the same information about gender inequity, though in different formats. Specifically, we measured participant feelings of state reactance and state self-efficacy immediately after each type of intervention.

We tested three hypotheses. Hypothesis 1 tested whether *WAGES-Academic* would be more effective in increasing participant knowledge and retention of that knowledge relative to the other conditions, specifically proposing the following:

- Hypothesis 1a The *WAGES* condition will increase participant knowledge about gender inequity relative to baseline, and this knowledge will be maintained at follow-up.
- Hypothesis 1b Compared to participants in the *Group Activity* condition, participants in the *WAGES* condition will report more knowledge about gender inequity after the intervention and at follow-up.
- Hypothesis 1c Compared to participants in the *Information Only* condition, participants in the *WAGES* condition will report more knowledge about gender inequity at follow-up.

Hypothesis 2 tested whether reactance and self-efficacy would explain the effectiveness of *WAGES-Academic* on knowledge retention, specifically proposing the following:

- Hypothesis 2a Compared to the *Information Only* condition, playing *WAGES* will result in less reactance and greater feelings of self-efficacy after the intervention.
- Hypothesis 2b Reactance and self-efficacy will mediate the relationship between intervention (*WAGES* vs. *Information Only*) and knowledge about gender inequity.

Hypothesis 3 tested whether participant gender would moderate any of the observed effects in Hypotheses 1 and 2. With regards to knowledge about gender inequity,

previous research indicates that women, relative to men, have more knowledge about the barriers that women face due to sexism, particularly in the context of career pursuits (Luzzo and McWhirter 2001). Thus, we expected women to have more knowledge than men about gender inequity across time points and across all three conditions.

With regards to reactance, we predicted that men would be more likely than women to demonstrate reactance in response to information about gender inequity. Because men are more likely than women to be the perpetrators of sexist behavior in the workplace (Pryor 1987), information about gender inequity might be particularly threatening because it would suggest that men, compared to women, must do more to change their behavior in order to eliminate gender inequity, and that men have more constraints on their behavioral freedom. Men also endorse sexism more than women (e.g., Becker and Swim 2011), and may be less inclined to accept information contrary to that endorsement. Thus, we expected that men would demonstrate more reactance compared to women in the *WAGES* and *Information Only* conditions, but expected no difference in the *Group Activity* condition, as this condition did not systematically present information about gender inequity.

With regards to self-efficacy, we expected that women, relative to men, would report greater feelings of self-efficacy after learning about gender inequity. Feelings of self-efficacy are influenced by whether or not an individual is familiar with a particular domain. For example, men report more efficacy than women in completing a complex computer task after a computer course (Busch 1995), which can be explained in part by the fact that men report more experience, familiarity, and support from others with using computers. Furthermore, Gist and Mitchell (1992) contended that self-efficacy beliefs should be higher when performance determinants are believed to be internal, variable, or controllable (e.g., effort) compared to when they are believed to be external, stable, or uncontrollable (e.g., task contingent, luck; cited in Stevens et al. 1993). Thus, we expected that for women compared to men, learning about ways to reduce gender inequity in the workplace would increase self-efficacy as it is a self-relevant domain that they are more familiar with. That is, learning about the problem of gender inequity and ways to reduce inequity in the workplace in both the *WAGES* and *Information Only* conditions should lead women to feel particularly empowered to address the issue. In support of this prediction, Weisgram and Bigler (2007) found that women who learned about gender discrimination demonstrated increases in self-efficacy relative to those who did not. We did not

expect that men and women would differ in self-efficacy beliefs in the Group Activity condition.

To summarize Hypothesis 3, we propose the following:

- Hypothesis 3a: We predicted that women, relative to men, would demonstrate more knowledge of gender inequity across time points and across conditions.
- Hypothesis 3b We predicted that men would report more reactance compared to women after learning about gender inequity in both the WAGES and Information Only conditions. We did not expect a gender difference in the Group Activity condition.
- Hypothesis 3c We predicted that women compared to men would report more self-efficacy after learning about gender inequity in both the WAGES and Information Only conditions. We did not expect a gender difference in the Group Activity condition.

We also included several trait individual difference measures as control variables in each analysis, specifically trait reactance, need for cognition, and trait empathy. We included these individual difference measures because we reasoned that each could influence the extent to which participants were willing and/or able to process the information in the intervention, thereby having an impact on the intervention's effectiveness. Trait reactance is an individual's propensity to react against new information (Hong and Page 1989). Given that our intervention provided participants with information that was likely new, some of which could be interpreted as threatening, we thought it necessary to control for this general tendency. Need for cognition is an individual's liking of and willingness to engage with and think about complex problems (Cacioppo et al. 1984). Given that the issue of gender inequity is a complex social problem, we thought it necessary to control for people's propensity to enjoy thinking about complex issues. Finally, trait empathy is an individual's willingness and propensity to adopt the perspective of others (Davis 1980). Given that thinking about the problem of gender inequity, particularly in an experiential learning intervention, involves taking the perspective of women who face gender inequity, we thought it necessary to control for people's ability to take the perspective of others.

Method

Participants

In exchange for course credit, undergraduates from an introductory psychology participant pool completed a three

part study (baseline, intervention, follow-up) in exchange for course credit. At baseline, 1249 undergraduates from the pool (705 women, 529 men, 15 gender unspecified) completed an online study. We contacted a random sample of 894 of those who had indicated willingness to consider further participation. Of those contacted, 30.2 % ($n=270$) agreed to participate in the intervention phase of the study and were included (see Table 1 for demographics). One additional participant was excluded because of age (41 years); all others in the sample were young undergraduates (aged 18 to 29). All participants who completed the intervention were contacted to participate in the follow-up. Of those invited, 90.0 % ($n=243$) agreed (139 women, 104 men, $M_{age}=19.26$, $SD_{age}=1.35$). Most identified themselves as non-Hispanic Caucasian (85.2 %), followed by African American (3.7 %), Asian American (3.3 %), and Latina/o (2.9 %), with 4.9 % unidentified.

Materials and Procedure

Baseline

Participants completed the Knowledge of Gender Equity Scale (KGE; Shields et al. 2011; Zappe 2006) as part of an online study that measured a number of individual differences. The KGE measures knowledge of gender bias and processes that contribute to workplace inequity (21 items: e.g., "Gender inequity is often the result of the accumulation of many small and subtle biases, rather than a large, obvious event."; "Women who report incidents of gender inequity are viewed positively by colleagues." [reverse scored]). Responses are made on a 1 (very much believe to be true) to 5 (very much believe to be false) scale. Responses were averaged such that high scores indicate more knowledge ($\alpha=.88$).

Intervention

In an ostensibly unrelated laboratory session, participants first completed the trait individual difference measures used as controls in all analyses: (1) The Need for Cognition Scale (Cacioppo et al. 1984) measures the tendency to engage in and enjoy cognitive endeavors (18 items: e.g., "I would prefer complex to simple problems."). (2) The Hong Psychological Reactance Scale (Hong and Page 1989) measures reactance proneness, including reactions to compliance and resisting compliance from others (14 items: e.g., "I resist the attempts of others to influence me."). (3) The Empathy Questionnaire (Davis 1980) measures the tendency to take the perspective of and have concern for others (28 items: e.g., "When I see someone being taken advantage of, I feel kind of protective toward them."). Participants responded using a 1 (not at all/extremely uncharacteristic of me) to 7

Table 1 Breakdown of age and race by condition and gender

	WAGES		Information only		Group activity	
	Women	Men	Women	Men	Women	Men
Total, %	66, 68.0 %	31, 32.0 %	47, 51.6 %	44, 48.4 %	45, 54.9 %	37, 45.1 %
Age (<i>M, SD</i>)	19.2 (1.12)	19.3 (1.12)	19.2 (1.09)	19.8 (2.25)	19.0 (1.30)	19.4 (1.28)
Race						
Caucasian	53, 80.3 %	25, 80.6 %	41, 87.2 %	39, 88.6 %	36, 80.0 %	36, 97.3 %
African-American	6, 9.1 %	1, 3.2 %	0, .0 %	0, .0 %	2, 4.4 %	0, .0 %
Latina/o	2, 3.0 %	1, 3.2 %	1, 2.1 %	2, 4.5 %	3, 6.7 %	0, .0 %
Asian	3, 4.5 %	2, 6.5 %	1, 2.1 %	0, .0 %	2, 4.4 %	1, 2.7 %
Unidentified	2, 3.1 %	2, 6.5 %	4, 8.5 %	3, 6.8 %	2, 4.4 %	0, 0.0 %

Age and race did not differ by gender and condition. We crossed condition and gender to create one variable with six levels; an independent samples chi-square test revealed that race did not vary by condition and gender ($p > .24$); a one-way ANOVA revealed that age did not vary by condition and gender ($p > .16$). With regards to gender composition, within each condition, independent samples chi-square tests reveal that more women than men participated ($ps < .001$); however, across conditions, there were no proportional differences ($p > .05$).

(very much /extremely characteristic of me) scale. Responses were averaged such that higher scores indicate a greater need for cognition ($\alpha = .90$), greater trait reactance ($\alpha = .86$), and greater trait empathy ($\alpha = .87$).

Participants next completed one of three intervention activities. (1) Participants in the *WAGES* condition completed the *WAGES-Academic* intervention described above. (2) Participants in the *Group Activity* condition played a modified version of Chutes & Ladders® in which they were assigned to Green and White teams before playing the game according to the standard rules. The game was followed by a structured discussion of group dynamics. The *Group Activity* condition mimicked *WAGES-Academic* in that participants played a team activity and engaged in a discussion about group dynamics, but no gender inequity information was systematically provided. (3) Participants in the *Information Only* condition received the information from *WAGES-Academic* on handouts, a non-experiential learning format. Participants had 15 min to read the handouts and had 8 min to read a transcribed version of the *WAGES-Academic* post-game discussion.

Following the intervention, participants completed the KGE ($\alpha = .90$). To assess the proposed mechanisms by which *WAGES-Academic* is effective at increasing knowledge about gender inequity, participants completed two measures created for this study: (1) State Reactance, which measured the extent to which participants denied the veracity of information provided during the intervention (four items: e.g., “Much of the information given today seemed exaggerated.”; see Appendix A for all items). (2) State Self-Efficacy, which measured the extent to which participants believed they had personal control or agency to act on what they learned during the intervention (seven items: e.g., “What I heard today provides opportunities for me to overcome obstacles.”; see Appendix B for all items). Items for

the State Self-Efficacy Scale were created by modifying items from the Self-Efficacy Scale (Sherer et al. 1982), a threat vs. challenge measure (Drach-Zahavy and Erez 2002), and emotion terms theorized to measure threat vs. challenge (Folkman and Lazarus 1985). Participants responded to the mechanism scales using a 1 (not at all/strongly disagree) to 7 (very much/strongly agree) scale. Responses were averaged such that higher numbers indicated greater reactance ($\alpha = .83$) and self-efficacy ($\alpha = .88$).

Follow-up

To assess knowledge retention, approximately 7 to 11 days after participating in the intervention, participants completed the KGE ($\alpha = .91$) scale as part of a larger online survey containing other scales irrelevant to the present investigation.

Results

Hypothesis 1: Knowledge

Hypothesis 1 predicted that (a) *WAGES-Academic* will increase participants’ knowledge about gender inequity over baseline and that this knowledge will be maintained at follow-up; (b) compared to participants in the *Group Activity* condition, participants in the *WAGES* condition will report more knowledge about gender inequity after the intervention and at follow-up; and (c) compared to participants in the *Information Only* condition, participants in the *WAGES* condition will report more knowledge about gender inequity at follow-up. To test hypotheses, we conducted a 3 (Intervention: *WAGES*, *Information Only*, *Group Activity*) X 3 (Time: Baseline, Intervention, Follow-up) mixed ANCOVA with time as the repeated measure, knowledge

(KGE) as the dependent variable, and need for cognition, trait reactance, and trait empathy as covariates. Trait empathy was a significant covariate, $F(1, 235)=15.49$, $p<.001$, $\eta_p^2=.06$, whereas need for cognition and trait reactance were not, $F_s(1, 235)<2.33$, $p_s>.12$. There was a main effect of Intervention, such that participants in both the WAGES ($M=3.66$, $SD=.42$, $p<.001$, $d=.60$) and Information Only conditions ($M=3.57$, $SD=.42$, $p<.02$, $d=.38$) had higher KGE scores than those in the Group Activity condition ($M=3.41$, $SD=.42$); participants in the WAGES and Information Only conditions did not differ ($p>.19$), $F(2, 235)=7.24$, $p<.001$, $\eta_p^2=.06$. This main effect was qualified by the predicted interaction, $F(4, 470)=14.18$, $p<.001$, $\eta_p^2=.11$, thus we used planned contrasts to test each hypothesis (refer to Fig. 1).

In support of *Hypothesis 1a*, compared to baseline ($M_{WAGES}=3.23$, $SD_{WAGES}=.49$), participants in the WAGES condition had a higher mean KGE score after the intervention ($M_{WAGES}=3.98$, $SD_{WAGES}=.53$, $p<.001$, $d=1.70$), and this higher mean was retained at follow-up ($M_{WAGES}=3.76$, $SD_{WAGES}=.53$, $p<.001$, $d=1.04$).

In support of *Hypothesis 1b*, participants in the WAGES condition had higher mean KGE scores than those in the Group Activity (GA) condition both after the intervention ($M_{GA}=3.52$, $SD_{GA}=.53$, $p<.001$, $d=.87$) and at follow-up ($M_{GA}=3.37$, $SD_{GA}=.53$, $p<.001$, $d=.74$).

In support of *Hypothesis 1c*, while KGE scores in the WAGES and Information Only (IO; $M_{IO}=3.88$, $SD_{IO}=.53$, $p>.23$) conditions did not differ at the end of the intervention, those in the WAGES condition retained their knowledge at follow-up significantly better than those in the Information Only condition ($M_{IO}=3.57$, $SD_{IO}=.53$, $p<.03$, $d=.36$).

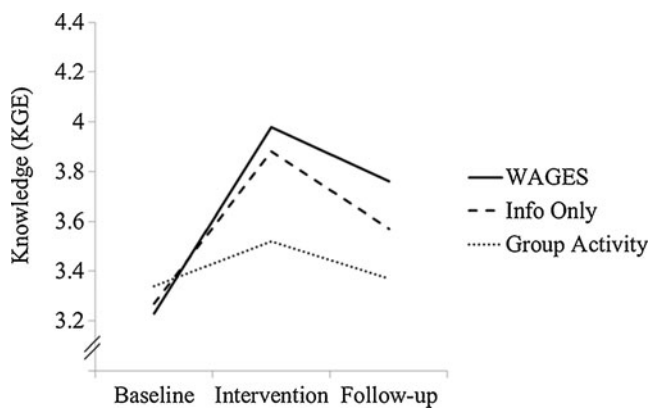


Fig. 1 Knowledge about gender inequity by time and intervention. At baseline, the three conditions did not differ. At the intervention phase, WAGES and Information Only reported more knowledge than the Group Activity condition ($p_s<.001$), while WAGES and Information Only did not differ. At the follow-up, WAGES reported more knowledge than both the Information Only and Group Activity conditions ($p_s<.03$). Participant gender is not included in the figure because gender did not interact with condition to predict knowledge

Hypothesis 2: Reactance and Self-Efficacy as Mediators

Hypothesis 2 predicted that (a) compared to participants in the Information Only condition, participants playing WAGES-Academic will have less reactance and greater feelings of self-efficacy after the intervention; and (b) reactance and self-efficacy will mediate the relationship between intervention (WAGES vs. Information Only) and knowledge about gender inequity at the follow-up. To test Hypothesis 2, we first examined whether reactance and self-efficacy differed by condition, by running a one-way (Intervention: WAGES, Information Only, Group Activity) between-subjects MANCOVA, controlling for need for cognition, trait reactance, and trait empathy. Trait empathy was a significant covariate in both analyses, $F_s(1, 264)=5.93$ & 23.06 , $p_s<.02$ & $.001$, $\eta_p^2=.02$ and $.08$, whereas need for cognition and trait reactance were not, $F_s(1, 264)<2.27$, $p_s>.13$. Supporting *Hypothesis 2a*, we found a significant effect for reactance, such that participants in both the WAGES ($M=2.32$, $SD=1.11$, $p<.002$, $d=.47$) and Group Activity ($M=2.30$, $SD=1.10$, $p<.002$, $d=.49$) conditions reported less reactance than the Information Only condition ($M=2.84$, $SD=1.11$); participants in the WAGES and Group Activity conditions did not differ ($p>.92$), $F(2, 264)=6.81$, $p<.002$, $\eta_p^2=.05$. Further supporting *Hypothesis 2a*, we also found a significant effect for self-efficacy, such that participants in the WAGES condition ($M=4.18$, $SD=1.29$) reported more self-efficacy than both the Group Activity ($M=3.57$, $SD=1.29$, $p<.002$, $d=.47$) and Information Only ($M=3.45$, $SD=1.29$, $p<.001$, $d=.57$) conditions; participants in the Group Activity and Information Only conditions did not differ ($p>.52$), $F(2, 264)=8.70$, $p<.001$, $\eta_p^2=.06$.

Next, we conducted a multiple mediator analysis to test the mechanisms underlying the finding that participants in the WAGES condition retained their knowledge to a greater extent relative to participants in the Information Only condition. We followed the bootstrapping procedure as outlined by Preacher and Hayes (2008), setting 95 % confidence intervals and using 5000 resamples. Intervention (WAGES vs. Information Only) was entered as the predictor; state reactance and self-efficacy were entered as mediators; trait reactance, trait empathy, need for cognition, and baseline knowledge (KGE) were entered as covariates; and knowledge at the follow-up was entered as the outcome variable. Trait empathy ($\beta=.13$, $t=2.40$, $p<.02$) and baseline knowledge ($\beta=.40$, $t=5.40$, $p<.001$) were significant covariates, while need for cognition ($\beta=.01$, $t=.15$, $p>.88$) and trait reactance ($\beta=.05$, $t=1.23$, $p<.21$) again were not. The overall model was significant, $F(7, 158)=13.85$, $p<.001$, $r^2=.38$ (Fig. 2). Supporting *Hypothesis 2b*, WAGES-Academic produced less reactance and more self-efficacy compared to the Information Only condition. In turn, both less reactance and

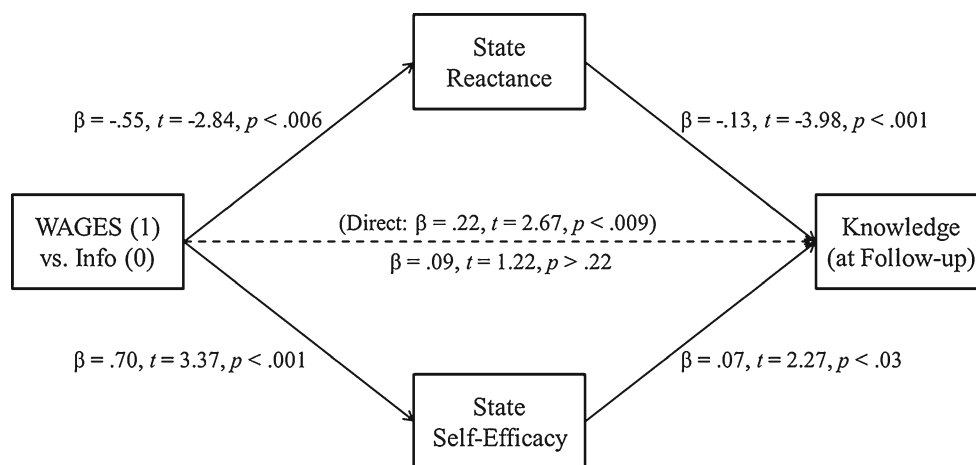


Fig. 2 State reactance and state self-efficacy mediate the relationship between the WAGES vs. Information Only (Info) conditions and knowledge about gender inequity at the follow-up. Solid lines indicate significant paths, while dashed lines indicate non-significant paths. Trait reactance, trait empathy, need for cognition, and baseline

knowledge (KGE) were entered as covariates, but are not depicted to simplify the presentation. Participant gender is not included in the figure because gender did not interact with condition to predict state reactance, state self-efficacy, or knowledge

greater self-efficacy predicted greater knowledge at the follow-up. The direct effect of Intervention on knowledge at follow-up was no longer significant when the mediators were included. Finally, the 95 % confidence intervals for reactance [.02, .16] and self-efficacy [.01, .12] did not include zero, suggesting that reactance and self-efficacy fully mediated this relationship.

Hypothesis 3: Participant Gender Moderates Hypotheses 1 and 2

Hypothesis 3 predicted that (a) women, compared to men, would demonstrate more knowledge about gender inequity across time points and conditions; (b) men, compared to women, would report more reactance in only the WAGES and Information Only conditions; and (c) women, compared to men, would report more self-efficacy in only the WAGES and Information Only conditions. To test hypotheses, we ran

a 3 (Intervention: WAGES, Information Only, Group Activity) X 2 (Participant Gender: Female, Male) MANCOVA, with knowledge at baseline, knowledge after the intervention, state reactance, and state self-efficacy as dependent variables; and with need for cognition, trait reactance, and trait empathy as covariates. Due to participant attrition rates, we ran a separate ANCOVA using the same model described above to test knowledge at the follow-up period. Please refer to Table 2 for all means and standard deviations.

In support of *Hypothesis 3a*, we found a main effect of gender such that women compared to men reported marginally more knowledge at baseline, $F(1, 268)=3.35, p < .07, \eta_p^2 = .01$, significantly more knowledge after the intervention, $F(1, 268)=17.14, p < .001, \eta_p^2 = .06$, and significantly more knowledge at the follow-up, $F(1, 234)=40.77, p < .001, \eta_p^2 = .15$. In partial support of *Hypotheses 3b and 3c*, we found a main effect of gender such that men compared to women reported more reactance, $F(1, 268)=5.49, p < .02, \eta_p^2 = .02$, and less

Table 2 Breakdown of gender by condition on knowledge, reactance, and self-efficacy

	Women			Men		
	WAGES (n=65)	Information Only (n=46)	Group Activity (n=43)	WAGES (n=32)	Information Only (n=45)	Group Activity (n=39)
Baseline KGE	3.27 (.50)	3.36 (.50)	3.45 (.49)	3.26 (.51)	3.22 (.50)	3.23 (.50)
Intervention KGE	4.13 (.53)	4.05 (.53)	3.61 (.52)	3.72 (.43)	3.78 (.52)	3.40 (.52)
Follow-up KGE	3.95 (.50)	3.81 (.51)	3.52 (.49)	3.38 (.51)	3.36 (.49)	3.18 (.50)
State Reactance	2.09 (1.12)	2.77 (1.13)	2.20 (1.10)	2.79 (1.14)	2.89 (1.11)	2.43 (1.12)
State Self-Efficacy	4.38 (1.30)	3.74 (1.32)	3.58 (1.29)	3.75 (1.29)	3.18 (1.28)	3.54 (1.30)

For all variables, there were significant gender differences such that women reported marginally more knowledge than men at baseline ($p < .07$), more knowledge at intervention ($p < .001$), more knowledge at follow-up ($p < .001$), less reactance ($p < .02$), and more self-efficacy ($p < .03$) across all conditions. Participant gender did not interact with intervention condition for any of the variables ($F_s < 1.69, p_s > .18$). Participants responded to the KGE measure on a 1 to 5 scale, and to the reactance and self-efficacy measures on a 1 to 7 scale

self-efficacy, $F(1, 268)=5.37, p<.03, \eta_p^2=.02$. Participant gender did not interact with intervention for any of the outcomes, $F_s(2, 268)<1.69, p_s>.18$. That is, contrary to what we proposed in *Hypotheses 3b and 3c*, we found that there were gender differences in reactance and self-efficacy in the Group Activity condition like those in the WAGES and Information Only conditions. This suggests that while women and men might differ in general on the outcome measures, intervention effectiveness was comparable for women and men.

Discussion

Results demonstrate that WAGES-Academic is an effective experiential learning tool for increasing knowledge about gender inequity in the workplace, and it does so in a manner that reduces participant reactance and promotes feelings of self-efficacy. Participants who completed WAGES-Academic exhibited increased knowledge of gender inequity, which was retained at least 1 week later. Importantly, while participants in the Information Only condition also exhibited increased knowledge immediately following the intervention, this knowledge was not retained over time. Mediation analysis further revealed that WAGES was more effective (vs. Information Only) at producing long-term increases in knowledge because it produced relatively less reactance and more self-efficacy. In other words, simply learning about gender inequity was not sufficient for knowledge retention. Rather, participants had to obtain the knowledge in a manner that linked it to their own experiences, made them feel that they could act on that knowledge, and did not elicit reactance against the information.

Regarding participant gender, we found that women reported greater knowledge after the intervention and at follow-up and marginally more at baseline, less reactance, and more self-efficacy compared to men, and that these differences did not vary by condition. While we predicted the main effect for knowledge, we were surprised that reactance and self-efficacy were impacted in the Group Activity condition. It may be possible that participants in the Group Activity brought up gender-based issues when discussing group dynamics. If so, we would then expect the main effect of gender that we discovered in the other two conditions (WAGES and Information Only) to occur in the Group Activity condition. Importantly, given that gender did not interact with intervention, we can conclude that any influence of gender was relatively constant across conditions and thus that gender did not impact the effectiveness of the intervention.

Along with earlier work (Shields et al. 2011), the present results suggests that WAGES-Academic is a valid activity to use to teach about gender inequity in the workplace. The inclusion of the Information Only comparison condition,

and the testing of reactance and self-efficacy as mediators, allowed us to better understand how WAGES works and strengthens our claims that it is an effective intervention. While increasing and maintaining knowledge about gender inequity is a necessary first step for the implementation of interventions aimed at reducing gender inequity, it is imperative to continue to examine the effectiveness of WAGES for other important outcomes. Given the range of negative effects that sexism has on women, including sexual harassment (Chan et al. 2008), our next efforts will be to examine whether WAGES-Academic reduces endorsement of sexism. In addition, future work will assess the extent to which WAGES leads to increased recognition of gender inequity when it occurs, and behavioral intentions and behaviors aimed at reducing gender inequity in the workplace.

As an experiential learning activity, WAGES is not limited to academic contexts and in fact could be adapted to a number of other contexts. Given that only 18 Fortune 500 companies were run by women as of 2012 (Hoare 2012), a version of WAGES for use by human resources training is sorely needed. Furthermore, with women comprising only about 29 % of all physicians (Physician Statistics 2012), yet comprising just under half of all medical students (Barzansky and Etzel 2011), WAGES could help with understanding the biases that continue to exist in medical education and academic medicine. Future work will be aimed at developing WAGES for use in these contexts.

In addition, future work will also be necessary to assess the duration of WAGES' effectiveness at increasing knowledge about gender inequity. Although participants at the 1 week follow-up still had significantly higher levels of knowledge than at baseline, their knowledge levels slightly decreased from that of immediately after playing. Longer evaluation periods will allow for the assessment of whether increases in knowledge level off, or ultimately return to baseline levels. Future work can also address whether the use of "booster sessions" might increase the effectiveness of WAGES over time.

The present investigation was conducted with undergraduates, which has implications for generalizability to other samples. Experiential learning is proposed to be effective for individuals across age and education levels (Cantor 1997; Springer et al. 1997), and so we would expect WAGES to be effective for individuals with a broad range of characteristics. The fact that we demonstrated the effectiveness of this version of WAGES, which was designed for university personnel in academic STEM domains, with an undergraduate sample suggests the power of experiential learning as demonstrated by WAGES. In an ongoing project we are obtaining evaluation data from college and university faculty and academic administrators.

Finally, it is important to stress that WAGES-Academic was tested on a sample who identified themselves primarily

as non-Hispanic Caucasian. As noted above, a number of WAGES items are also relevant to men from underrepresented groups and multiple marginalization of women, as through racial, ethnicity, or ability status. The test of whether WAGES is effective with these groups requires a more diverse experimental sample. That said, if there are differences between these groups and the non-Hispanic Caucasian sample, we would expect them to be a matter of degree given the salience of everyday racism in U.S. culture (Deitch et al 2003; Sue et al. 2007). In other words, we would expect a pattern similar to that found for gender.

In sum, the present results indicate that WAGES is a promising intervention to teach about gender inequity in the workplace. WAGES is a brief activity (ranging from 60–90 min) that is highly portable and does not require an expert to administer. Furthermore, while the content is specific, it has a general appeal to a large audience, and does not need tailoring to individual groups. Fully addressing sexism will take concerted efforts on many fronts, including exposing individuals to knowledge of gender inequity in a manner that does not increase reactance or impede feelings of self-efficacy. WAGES offers a powerful model for how experiential learning can deliver this knowledge.

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Appendix A State Reactance Items

INSTRUCTIONS: We would like to hear about your reactions to the study. Please indicate the extent to which you agree or disagree with the following statements using the scale below.

1	2	3	4	5	6	7	
Strongly Disagree					Strongly Agree		

- (1) I disagree with much of the information given today
- (2) I agree with the information given today
- (3) Much of the information I got today I accept as true
- (4) Much of the information given today seemed exaggerated

Note: Items 2 and 3 are reverse scored

Appendix B State Self-Efficacy Items

INSTRUCTIONS: We would like to hear about your reactions to the study. Please indicate the extent to which you agree or disagree with the following statements using the scale below.

1	2	3	4	5	6	7	
Strongly Disagree					Strongly Agree		

- (1) What I heard today provides opportunities for me to strengthen my self-esteem^a
- (2) Being in this study made me feel that certain that when I make plans, I can make them work^b
- (3) What I heard today provides opportunities for me to overcome obstacles^b
- (4) Being in this study made me feel that even if I can't do a job the first time, I can keep trying until I succeed^a
- (5) What I heard today challenges me^b
- (6) What I heard today provides opportunities to exercise my reasoning skills^b
- (7) I feel hopeful about using the information given today^c

Note: Items were adapted from several scales as follows
a=Items adapted from the Self-Efficacy Scale; Sherer et al. (1982)

b=Items adapted from threat vs. challenge measures; Drach-Zahavy and Erez (2002)

c=Item adapted from the emotions that measure threat and challenge; Folkman and Lazarus (1985)

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